UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,546	10/02/2003	Mohammad Jaber Borran	873.0129.U1(US)	2515

29683 7590 07/27/2005

HARRINGTON & SMITH, LLP
4 RESEARCH DRIVE
SHELTON, CT 06484-6212

EXAMINER	
JOSEPH, JAISON	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/678,546	BORRAN ET AL.	
	Examiner	Art Unit	
	Jaison Joseph	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2 and 12* is/are allowed.

6)☐ Claim(s) *1, 3 - 7, 11, 13 -19, and 21 - 22* is/are rejected.

7)☐ Claim(s) *8 - 9, and 20, and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 - 23 are pending.

Response to Arguments

2. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

3. Claim 1, 3, 7, 10, 11, 13 - 19 is rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility.

Applicant claims an encoder in claim 1, 7, 11, 14, and 17 and claims recites "the selected subset includes at least two constellation points that are separated from one another by a distance based on a conditional distribution". However, in transmitter, positions of all the points are known and therefore, there is no distribution. Further the Euclidean distance can also be characterized as a distance based on a conditional distribution. In the applicants remark, applicant describes "a distance based on a conditional distribution is explicitly described at page 5, line 31 to page 6, line 2" talks about the a partially coherent constellation is a constellation that assumes less than perfect knowledge of channel state information at the receiver. Therefore it is believed that the applicant is trying to recover the signals send over the unknown channel using the "conditional distribution".

Claim 1 is also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial

asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Regarding claim 10, 13, 15 – 16, 18 – 19 are rejected because of as being depend on a above rejected claims.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Park et al (US Patent 5,537,430).

Regarding claim 1, Park et al discloses a method of encoding plurality of bits comprising selecting one of at least two subsets of signal constellation and a point within said selected subset (se column 1, lines 41 – 44) and modulating the selected point using a carrier waveform (see column 4, lines 46 – 48), wherein the selected subset includes at least two constellation points that separated from one another by a distance based on a conditional distribution (see column 1, line 38).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 3 – 6, 10, and 21 – 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (US Patent 5,537,430) in view of Ramchandran et al (US Patent 5,267,021).

Regarding claim 3, which inherits the limitations of claim 1, Park et al failed to teach selecting a subset of a signal constellation and point within said selected subset based on a plurality of K1+K2 bits, using K1 bits to select said subset and the K2 bits select the point within the said subset. However, Ramchandran et al teach selecting a subset of a signal constellation and a point within selected subset comprises plurality of K1+K2 bits, using K1 of the bits to select said subset and the K2 bits to select the points within the said subset (see column 11, lines 65 – 68 and column 12, lines 1 – 3). Therefore, it would be obvious to an ordinary skilled in the art at the time the invention was made to use Ramchandran et al.'s coding scheme in Park et al.'s encoder to benefit enhanced immunity to such random channel impairments as additive noise, without sacrificing the source bit rate or requiring additional broadcast bandwidth.

Regarding claim 4, claimed method including the features corresponding to subject matter mentioned above in rejection of claim 3 is applicable hereto.

Further park et al teach encoding k1 bits into n coded bits and selecting one of 2^n mutually exclusive subsets with n encoded bits, wherein n is greater than k1 (see column 5, lines 29 – 57).

Regarding claim 5, which inherits the limitations of claim4, Park et al teach the n = k1 + 1 (see column 5, lines 29 – 57). Further Ramchandran et al teach that k2 = 2, and it will be obvious to an ordinary skilled in the art to choose any number of bits to identify a point in a subset. Choosing number of bits to represent a g K2 =1 is a matter of design choice.

Regarding claim 6, Park et al teach the limitations of claim 6 (see column 5, lines 29 – 57).

Regarding claim 10, which inherits the limitations of claim 1, Park et al failed to teach the method comprising transmitting the carrier, receiving the carrier over a fading channel and decoding the symbol using a Viterbi algorithm. However Ramchandran et al. teach a method of transmitting the carrier, receiving the carrier over a fading channel and decoding the symbol using a Viterbi algorithm (see column 12 lines 61 – 63). Therefore it would be obvious to an ordinary skilled in the art at the time invention was made to use Ramchandran et al.'s receiver instead of Park et al.'s receiver to reduce design complexity.

Regarding claim 21, claimed method including the features corresponding to subject matter mentioned above in rejection of claim 5 is applicable hereto

Regarding claim 22, claimed method including the features corresponding to subject matter mentioned above in rejection of claim 5 is applicable hereto

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (US Patent 5,537,430) in view of Ramesh et al. (US Patent 5,363,407).

Regarding claim 11, Park et al discloses a transmitter comprising an encoder having an input for receiving plurality of input bits (see figure 3, elements, 202) an mapper having an input to an output of the encoder (figure 3, element 220), encoding plurality of bits comprising selecting one of at least two subsets of signal constellation and a point within said selected subset (se column 1, lines 41 – 44) and modulating the selected point using a carrier waveform (see column 4, lines 46 – 48), wherein the selected subset includes at least two constellation points that separated from one another by a distance based on a conditional distribution (see column 1, line 38). Park et al failed to teach a computer readable storage medium coupled to the mapper for storing at least one constellation. Ramesh et al teach a computer readable storage medium (see column 8, lines 4 – 9) coupled to the mapper for storing at least one constellation. Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to provide a communication system with high spectral efficiency and a high channel capacity.

9. Claims 13 – 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (US Patent 5,537,430) in view of Ramesh et al. (US Patent 5,363,407) and Ramchandran et al (US Patent 5,267,021).

Regarding claim 13, which inherits the limitations of claim 11, the combination of Park et al and Ramesh et al failed to teach selecting a subset of a signal constellation and point within said selected subset based on a plurality of

K1+K2 bits using K1 bits to select said subset and the K2 bits to select the point within said subset. However, Ramchandran et al teach selecting a subset of a signal constellation and point within said selected subset based on a plurality of K1+K2 bits using K1 bits to select said subset and the K2 bits to select the point within said subset. Therefore, it would be obvious to an ordinary skilled in the art at the time the invention was made to use the Ramchandran et al.'s coding scheme in Park et al and Ramesh et al.'s transmitter to benefit enhanced immunity to such random channel impairments as additive noise, without sacrificing the source bit rate or requiring additional broadcast bandwidth.

Regarding claim 14, claimed method including the features corresponding to subject matter mentioned above in rejection of claim 11 is applicable hereto. Further park et al teach encoding k1 bits into n coded bits and selecting one of 2^n mutually exclusive subsets with n encoded bits, wherein n is greater than k1 (see column 5, lines 29 – 57).

Regarding claim 15, which inherits the limitations of claim 14, claimed method including the features corresponding to subject matter mentioned above in rejection of claim 5 is applicable hereto

Regarding claim 16, which inherits the limitations of claim 15, claimed method including the features corresponding to subject matter mentioned above in rejection of claim 6 is applicable hereto.

Allowable Subject Matter

10. Claims 2 and are allowable over prior art of record.

Claims 8 – 9, 20 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jaison Joseph whose telephone number is (571) 272-6041. The examiner can normally be reached on M-F 8:30 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jaison Joseph
07/22/2005

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600